

[Home](http://iopscience.iop.org/) [Search](http://iopscience.iop.org/search) [Collections](http://iopscience.iop.org/collections) [Journals](http://iopscience.iop.org/journals) [About](http://iopscience.iop.org/page/aboutioppublishing) [Contact us](http://iopscience.iop.org/contact) [My IOPscience](http://iopscience.iop.org/myiopscience)

The matrix representation of the operators acting in the Radcliffe space

This article has been downloaded from IOPscience. Please scroll down to see the full text article.

1974 J. Phys. A: Math. Nucl. Gen. 7 L25

(http://iopscience.iop.org/0301-0015/7/2/020)

View [the table of contents for this issue](http://iopscience.iop.org/0301-0015/7/2), or go to the [journal homepage](http://iopscience.iop.org/0301-0015) for more

Download details: IP Address: 171.66.16.87 The article was downloaded on 02/06/2010 at 04:55

Please note that [terms and conditions apply.](http://iopscience.iop.org/page/terms)

LETTER TO THE EDITOR

The matrix representation of the operators acting in the Radcliffe space

L Kolodziejczyk

Theoretical Physics Department, University in Lódź, Lódź, Poland

Received **30** July **1973, in** final form **12** November **1973**

Abstract. The rule for constructing the matrix representation of operators expressed as functions of (S_+, S_-, S_*) is given.

We deal with the functions

$$
\|\mu\angle = (1+|\mu|^2)^s |\mu\rangle = \sum_{p=0}^{2S} {2S \choose p}^{1/2} \mu^p |p\rangle, \tag{1}
$$

where $|\mu\rangle$ are the Radcliffe functions determining the spin coherent states. Let us choose any arbitrary set of complex numbers μ_0 , μ_1 ,..., μ_{2S} which satisfy the only restriction

$$
\Delta = \begin{vmatrix} 1 & \mu_0 & \mu_0^2 & \cdots & \mu_0^{2S} \\ 1 & \mu_1 & \mu_1^2 & \cdots & \mu_1^{2S} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & \mu_{2S} & \mu_{2S}^2 & \cdots & \mu_{2S}^{2S} \end{vmatrix} \neq 0.
$$
 (2)

We can substitute the new basis $\|\mu_0\|$, $\|\mu_1\|$, ..., $\|\mu_{2S}\|$ for the basis $|p\rangle$ in formula (1).
As a consequence, the functions $\|\mu\|$ assume the form

$$
\|\mu\right\rangle = \frac{1}{\Delta} \sum_{p=0}^{2S} \sum_{t=0}^{2S} \mu^p M_{tp} \|\mu_t\right\rangle, \tag{3}
$$

where M_{in} is a subdeterminant.

The matrix element related to any operator $\hat{\mathscr{G}}$ assumes the form

$$
\langle \lambda || \hat{\mathscr{G}} || \mu \rangle = \sum_{p,q}^{2S} (\lambda^*)^q \mu^p A_{qp}, \qquad (4)
$$

where

$$
\boldsymbol{A}_{qp} = \frac{1}{|\Delta|^2} \sum_{\boldsymbol{H}}^{2S} \, \boldsymbol{M}_{jq} \text{*} \langle \mu_j || \hat{\mathscr{G}} || \mu_i \rangle \boldsymbol{M}_{tp}
$$

must be independent of any basis. The matrices A_{op} may be recognized as the relevent operator representation.

It is easy to verify that this matrix representation obeys the following algebra:

$$
A_{qp}^{12} = \sum_{r}^{2S} \frac{A_{qr}^{1} A_{rp}^{2}}{\binom{2S}{r}},
$$
\n(5)

where $A_{\sigma p}^{12}$ is related to

$$
\hat{\mathscr{G}}^{12} = \hat{\mathscr{G}}^1 \hat{\mathscr{G}}^2.
$$

L25